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REPORT OF THE HYDROGRAPHIC SERVICE ROYAL AUSTRALIAN
NAVY FOR THE YEAR ENDED 30TH JUNE 1982 ISSUE NUMBER 18
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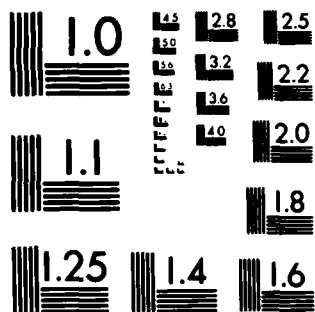
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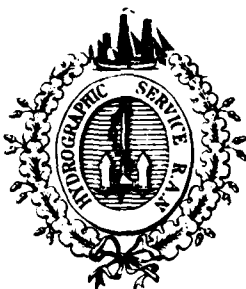


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NATIONAL BUREAU OF STANDARDS-1963-A

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1981-82
DEPARTMENT OF DEFENCE (NAVY OFFICE)



REPORT
of the
HYDROGRAPHIC SERVICE
ROYAL AUSTRALIAN NAVY
for the year ended 30th June 1982

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HYDROGRAPHIC SERVICE, R.A.N.

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1. INTRODUCTION

This Report describes briefly the work of the Surveying Service and Hydrographic Office of the Royal Australian Navy.

The period covered by the report, 1st July 1981 to 30th June 1982, is selected to provide an up-to-date account for the annual meeting of the National Mapping Council. Statistics relating to production, sales and issues are for the same period.

After 36 years in the Royal Australian Navy, 26 years of them as a hydrographic specialist and, since 1976, as Hydrographer, Captain M. Calder, A.M., R.A.N., retired on 2nd February 1982. He was temporarily succeeded by Commander J.J. Doyle, R.A.N., until 21st May 1982 when the latter was relieved by the present incumbent.

On 22nd June 1982, the Flag Officer Naval Support Command (Rear Admiral K. Vonthethoff) carried out the biennial inspection of the Hydrographic Office.

A handwritten signature in dark ink, appearing to read 'John Myres', with a horizontal line drawn through the middle of the signature.

(J.A.L. MYRES)
Captain, Royal Navy,
Hydrographer R.A.N.

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2. GENERAL

The Inter-Departmental Group (IDG) formed in June 1981 as a result of the Review of Commonwealth Functions (RCF) (Lynch Committee), enquired into what scope existed to merge the Commonwealth authorities involved in Mapping, Charting and Surveying activities. The IDG submitted its report to Cabinet in August 1981 and the Cabinet Decision was released on 26th October 1981. This decision established a Standing Interdepartmental Group (SIG), now called the Commonwealth Coordinating Group on Mapping, Charting and Surveying (CCGMCS), at senior public service level on which the Departments of Defence, Administrative Services, and National Development and Energy are represented. The Hydrographer can be called to meetings of the CCGMCS as a technical advisor to the Department of Defence representative.

Paragraph 3 of the Cabinet Decision states, inter alia, "that existing machinery satisfactorily co-ordinates the hydrographic program needed to meet the requirements of Defence and commercial shipping users".

This confirms the 1946 Cabinet Decision which vested in the Royal Australian Navy the national responsibility for surveying Australian waters and publishing nautical charts in the Australian series.

Surveys carried out by naval units are undertaken for defence purposes, navigational safety and national development. Priorities are determined after consultation between the Departments of Defence, and Transport and Construction, and these priorities are published in a 5-year Hydroscheme. This report covers the second year of Hydroscheme 1980.

The charts in the Australian series are produced from information obtained from a number of sources including RAN hydrographic units and other authorities involved in hydrographic and topographic surveying. In addition, much information is received in the form of Hydrographic Notes from a wide variety of mariners.

The charts are available for issue to the Defence Forces and for sale through Chart Agencies to all who operate, or have an interest, in the marine environment. Charts are maintained by weekly Notices to Mariners and by a regular programme of reprints which include necessary revisions.

The Hydrographic Service is responsible for the production and distribution of the Australian National Tide Tables, supports the RAN's Oceanographic and Meteorological activities and maintains the Australian Oceanographic Data Centre.

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3. HYDROGRAPHIC SURVEYING

A. SHIP REPORTS

H.M.A.S. MORESBY

Commander J.J. Doyle R.A.N. 1.7.81 - 15.12.81
Commander P.A. Hardy R.A.N. 16.12.81 - 30.6.82

MORESBY completed three surveys on the west and northwest coast during the period covered by this report. She commenced a major refit at H.M.A.S. STIRLING in April 1982; this refit is expected to be completed by early September.

Joseph Bonaparte Gulf: This survey (on a scale of 1:50,000), commenced in May 1981, was completed on 24th July, and was a continuation of previous work which is steadily progressing surveys from west to east in the Gulf. Efforts during this period were directed towards the shoal areas in the Gulf's south-east corner and consequently a major proportion of the sounding was carried out by the ship's three 10 metre survey motor boats.

The survey was controlled by an Argo DM 54 hyperbolic chain; of interest is the fact that an Argo receiver was mounted in the ship's Bell 206B helicopter and this aircraft used to delineate drying banks, mangrove edges and other time-consuming features.

North West Cape: The area covered by this survey comprised the inshore waters from Pt. Murat to Pt. Cloates on scales of 1:25,000 and 1:50,000, and a large off-shore area on a scale of 1:250,000.

The survey was conducted between 7th September to 26th November 1981, and was controlled by a combination of Argo DM 54 in range/range or hyperbolic modes and Motorola Mini Ranger 3. The survey was hampered by gale-force winds and this seriously reduced the output of the survey motor boats. This was the last survey done by the old boats, DART, BEAGLE and FANTOME which have given sterling service since the mid-1960's. These have been replaced by new aluminium-hulled boats with water-jet propulsion.

Whilst on passage to the south-west of Carnarvon, MORESBY carried out an unsuccessful search for the wreck of the World War II cruiser H.M.A.S. SYDNEY.

Dongara to Cape Leschenault: On 25th January 1982, MORESBY sailed from Cockburn Sound to commence work in the very large survey area off Dongara. Sounding was progressed from the northern limits with the new survey motor boats operating independently from a base in Dongara. Work in the inshore areas was greatly hindered by numerous crayfishing pots which were encountered in the vicinity of shoals.

Sounding was controlled by Argo DM 54 in the hyperbolic mode with additional coverage provided by Mini Ranger 3. Argo stations were established at Leander Pt., Pelsart I. and Escape River. MORESBY returned to H.M.A.S. STIRLING on the 7th April to commence her major refit.

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H.M.A.S. FLINDERS

Lieutenant Commander G.J. Bond R.A.N. 1.7.81 - 26.4.82

Lieutenant Commander M.A. Bolger R.A.N. 27.4.82 - 30.6.82

During the period covered by the report H.M.A.S. FLINDERS has spent two survey-seasons in the Barrier Reef off Mackay to complete a deep water route through the reef, and in May 1982 commenced work in the eastern side of the Gulf of Carpentaria.

Hydrographer's Passage: The aim of this survey was to provide a direct route through the Barrier Reef for vessels using the Hay Point coal-loading facility. Deep-draught vessels carrying coal to Japan are presently obliged to pass around the southern extremities of the Barrier Reef; the new passage has the potential of cutting 520 miles from a round voyage between Hay Pt. and Japan.

This survey was carried out from August to November 1981 and from January to March 1982. Horizontal control was provided by a hyperbolic ARGO DM 54 chain with shore stations established at Slade Pt., Holbourne I. and Tern I. Tidal stations were set up at Penrith I., Creal Rf. and Bugatti Rf.

The result of this survey is an excellent deep-water route from Penrith I. to Bugatti Rf., and seaward to the 200 metre line. Considerable difficulty was experienced in the area outside the outer barrier of reefs where a large number of shoals were unexpectedly encountered. Tidal streams were measured along the passage and the entire route checked by side-scan sonar.

A study of the pilotage difficulties and the requirements for navigation aids in the passage is currently being made by the Department of Transport and Construction and by the Queensland Coast and Torres Strait Pilots.

Gulf of Carpentaria: FLINDERS departed Cairns on 4th May, after a month's maintenance and leave period, and commenced work in the totally unsurveyed waters between Vrilya Pt. and Pennefather R. This is a continuation of the ship's 1977 work. Excellent progress has been made and the survey will be terminated in late July 1982.

B. PLANS FOR 1982-83

H.M.A.S. MORESBY - is due to complete her major refit in mid-September 1982 and will spend the remainder of the year completing a survey in the Dongara area which was begun in the first half of 1982. After Christmas leave and assisted maintenance at H.M.A.S. Stirling, she will deploy to the south-west coast and carry out surveys in the Esperance area during the first three months of 1983. Thereafter she will resume the large programme of surveys in Joseph Bonaparte Gulf.

H.M.A.S. FLINDERS - will spend July 1982 progressing the survey north of Weipa in the Gulf of Carpentaria, before spending August in Cairns for maintenance, leave and Annual Inspection. From September to November she will work in Torres Strait where she will endeavour to prove an alternative and perhaps deeper route parallel to, and to the south-east of, the Great North East Channel. She is programmed to spend 8 weeks in Cairns between mid-November 1982 and mid-January 1983 for leave and assisted maintenance. This will be followed by surveys south of Cairns which will be a continuation of 1980 surveys; she will commence a major refit in Cairns on 11th April 1983.

M.V. CAPE PILLAR - This vessel is under contract from the Department of Transport and, with a small contingent of naval surveyors, is programmed to carry out a survey of Indispensable Strait in the Solomon Islands under the Defence Co-operation Programme. The vessel will be in the Solomons for four months from July to October 1982.

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4. OCEANOGRAPHY

Naval vessels operate in the ocean environment; the strategic deployment and tactical effectiveness of their weapons and sensors is dependent on the environment. From this stems the need for oceanographic knowledge within the Navy. To improve this knowledge there is an increasing commitment to the collection, archiving and dissemination of oceanographic data, which is demonstrated by the commissioning of H.M.A.S. COOK, and the planned expansion of the Australian Oceanographic Data Centre (AODC).

The Hydrographer is responsible for the co-operation and development of oceanographic policies, priorities and practices in the R.A.N. The principal components of Hydrographer's oceanographic work are contained in three areas:

- A. Research Ships;
- B AODC;
- C Fleet Oceanographic Support Services.

A. SHIP REPORTS

H.M.A.S. KIMBLA

H.M.A.S. KIMBLA is now an elderly lady. She was launched in 1955 as a boom defence vessel and converted to a trials ship in 1959. During the winter of 1982 she has undergone a refit that will give her several more years of useful service in her dual roles of oceanographic research and buoy-laying.

During the year KIMBLA carried out the following research voyages:

1981

14 Sept - 20 Sept	XBT survey in the Tasman Sea for R.A.N. Research Laboratory.
23 Sept - 24 Sept	Testing acoustic equipment for future propagation experiments for R.A.N. Research Laboratory.
8 Oct - 14 Oct	Collecting bottom samples from the continental slopes off Grafton Passage for the Australian Museum.
28 Oct - 1 Nov	XBT and current data collection for R.A.N. Research Laboratory in the Tasman Sea and Bass Strait Oil Rig restricted area.
6 Nov - 11 Nov	Hydrographic and high density XBT survey east of oil rig "Kingfish B" and XBT survey on return passage to Sydney for R.A.N. Research Laboratory.
16 Nov - 20 Nov	XBT survey of area between Port Stephens and Jervis Bay and 120 miles offshore for R.A.N. Research Laboratory.
21 Nov - 22 Nov	XBT survey and dredging of continental slope in the region of the Jervis Bay canyon for the R.A.N. College.

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1982

29 Jan	XBT section in the Bass Strait Oil Rig restricted area for R.A.N. Research Laboratory.
2 Feb - 8 Feb	Geophysical cruise, including sub-bottom profiles, for the Victorian Institute of Marine Science.
10 Feb - 18 Feb	Collecting of bottom samples and laying current measuring devices for Victorian Institute of Marine Science.
22 Feb - 27 Feb	Collecting water and plankton samples for Victorian Institute of Marine Science.

H.M.A.S. COOK

It had been hoped that H.M.A.S. COOK would become fully operational in 1981/2. However, teething troubles have continued to dog her and, apart from one short trial period at sea during which her narrow beam echo-sounder underwent development trials, she has remained in Sydney. The principal problems have been associated with her main machinery, and it is hoped that she will sail for surveys in mid-1983.

COOK has a dual role as a hydrographic and oceanographic ship. Her major equipments and capabilities include:

- Bow thruster
- Active rudder
- Precision depth recorders
- Stabilised Narrow Beam Echo Sounder
- Oceanographic Winch
- Hydrographic Winches
- Linear Cable Engine
- Oceanographic Laboratory
- Data Centre

The narrow beam echo sounder is worthy of special notice. One of few such equipments in the world, it scans, records and plots depths over a swathe 35° wide.

B. AUSTRALIAN OCEANOGRAPHIC DATA CENTRE

Bathothermal Data Bank

Over the past twelve months the number of bathothermal observations archived has remained static. Data acquired from a number of sources has been digitised and is now stored on magnetic tape. This newly acquired data will be added to the main data bank when present software problems have been resolved.

Requests for data from the civilian community remain steady although the size and complexity of requests have increased. The AODC is also utilising its involvement with the Intergovernmental Oceanographic Commission by acquiring data for Australian organisations from World Data Centre 'A' (Oceanography) in Washington, USA.

The AODC is continuing to supply data and information to various areas within Defence.

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Fleet XBT's

The Fleet has maintained a satisfactory standard of XBT probe deployment, launching over 3000 with a success rate of nearly 70%. Steps are being taken to improve this success rate. Appendix VII contains a list of XBT data rendered by ships and units during the period.

IGOSS

The AODC's involvement with the Integrated Global Ocean Services System (IGOSS) has increased with the installation of a telex machine in the Hydrographic Office. Since January 1982 over 12,000 bathy signals have been received from around the world via IGOS. This data can be made available on request.

Expansion of AODC

Considerable effort has been devoted to expanding the capabilities of the AODC to a level where it can properly support Defence oceanographic requirements. This expansion will also enable AODC to meet its international data exchange commitments and provide the Australian civil marine science community with a comprehensive data archiving centre.

Progress is being made towards an in-house computer system. Allocation of funds for the project has been approved and work is currently at the system-design stage. It is planned that the new system will be operational in mid-1985. It is hoped that the necessary manpower to operate the system affectively will be available by that time.

C. SUPPORT SERVICES

Sonar Range Prediction

Propagation loss curves for use in passive sonar range prediction are issued to the Fleet and the R.A.A.F. on request via N.A.S. NOWRA. The system has now been extended to include active Sonar frequencies following validation by R.A.N. Research Laboratories. This system will be further tailored to suit the various user requirements.

Tasman Sea Analysis

All available data for the Western Tasman sea area is collected and analysed at N.A.S. NOWRA to produce a weekly chart of oceanographic conditions. The data used includes satellite sea surface temperatures, ship and aircraft-launched bathythermographs, and satellite-tracked current buoys. This service commenced early in 1981 on a monthly basis, and became a weekly product early in 1982 in response to the demand. The output includes a sea surface temperature analysis, warm core eddy positions and currents.

Oceanographic Briefs

Briefs are produced in support of naval and airforce exercises, deployments and training requirements. In 1981/82 these have included exercise "Kangaroo '81" in the Coral Sea, and a Joint Study Period on the Southern Ocean at the Joint Anti-Submarine School.

Education

With the increasing availability of support products and the greater complexity of naval warfare, it is imperative that the relevant personnel are fully briefed on environmental conditions and are aware of the operational implications of the environment to ensure that maximum tactical advantage is achieved. To this end, oceanographic staff have an increasing input to career courses and further course planning is underway. The need for expansion in this area is underlined by the establishment of an applied oceanographic billet within the Joint Anti-Submarine School.

Oceanographic Support Manual

An Oceanographic Support Manual is planned to bring together basic military oceanographic topics, support products and regional oceanography.

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5. METEOROLOGY

R.A.N. Air Station, Nowra

The Meteorological Department at the Naval Air Station at Nowra comprises the meteorological office, the upper air observing section and the R.A.N. School of Meteorology.

The meteorological office is fully amalgamated with the Bureau of Meteorology via the Bureau's teleprinter and landline facsimile networks. It operates on a 24 hour-per-day basis, making surface observations over the full range of meteorological parameters. The upper air section is integrated into the network of Bureau upper air observing stations, making soundings of upper winds 3 times per day and radiosonde ascents twice per day.

The office provides a full range of forecasting facilities, which are also available 24 hours-per-day if required. Routine aviation forecasts are provided for the airfield (average 55 per month), the local aviation area (30 per month) and individual route forecasts (average 65 per month). Specific maritime forecasts are also provided to units of the Fleet for their areas of operation, at an average of 480 per month. Individual forecasts, meteorological data and climatological briefs are specially prepared for a variety of non-routine tasks.

Individual meteorological briefings are given to all squadrons operating from the Air Station.

The meteorological office conducts, on a weekly basis, analysis of oceanographic conditions in the Western Tasman Sea, and disseminates these to a wide range of users. In co-operation with the Australian Oceanographic Data Centre (AODC), the office also produces forecasts of oceanic acoustic conditions. In this first full year of operation, 239 real-time forecasts were provided. Climatological summaries of these conditions are produced by the AODC.

The R.A.N. School of Meteorology conducts a wide range of training and familiarization courses to meet Service requirements. The school trains all R.A.N. Meteorological observers in basic observing and plotting, advanced observing, radar windfinding and radiosonde operation. Familiarisation courses are provided for aircrew, air traffic controllers, and junior seamen officers.

Sea-borne aviation support

A meteorological office operated onboard H.M.A.S. MELBOURNE prior to her de-commissioning in June 1982. This office provided an observational and forecasting service to front-line embarked squadrons and to the ship's command, in areas of meteorology and acoustic oceanography. A similar organisation with up-dated facilities is planned for H.M.A.S. MELBOURNE's replacement.

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6. PERSONNEL

Naval

An overall build-up in the numbers of uniformed personnel has occurred during the year; however, a severe shortage of experienced, more senior officers was exacerbated by two early retirements. To ease this situation two officers on loan from the Royal Navy's Hydrographic Service, are now filling higher management positions and a Reserve Officer was employed in the Hydrographic Office for a three month period. Another result of this shortage has been that a General Service officer has been posted in command of H.M.A.S. COOK.

In addition to the specialist complements of R.A.N. surveying and oceanographic ships, the Hydrographic School and the headquarters staff, surveying officers have been posted on exchange in the United Kingdom and with the Fijian Hydrographic Unit, and a CPOSR has been on loan in the Solomon Islands as part of the Defence Co-operation Programme (DCP).

In June 1982, two officers and four SRs embarked in M.V. CAPE PILLAR to carry out a four-month's survey in the Solomon Islands, also as part of the DCP programme.

Civilian

The short-fall in establishment numbers within the Hydrographic Office has had some effect on production output. The re-organised internal management structure has not been able to be fully implemented and, until adequate staffing levels are achieved, the full benefit of automated chart production will not be seen.

Anticipation of recruitment of new staff of varying grades has seen the preparation of a cartographic system training programme to meet part of the overall training needs of the new staff, in order to bring them to the level required for charting. The Defence trainee scheme continues to be an important source of future cartographers. The quality of trainees thus far has been high both in academic and technical competence. One trainee, Mr. Mark Battaglione, gained a prize for "Overall Achievement and Excellence in Photogrammetry" in the Associate Diploma of Cartography, 1981. Two Defence Science Cadets were appointed to the Hydrographic Office in 1982 for honours studies in Science. Miss Leanne Wilkes, Trainee Draughtswomen, received a prize for coming first in the final year of the Cartography Certificate 1981.

Appendix IV shows the numbers of personnel employed in the Hydrographic Service on 30th June 1982, and Appendix V nominates those in senior positions in Department of Defence (Navy), Canberra, and in the Hydrographic Office in Sydney, on the same date.

Appendix VI contains lists of major meetings attended by senior members of the Department during the year and a record of the principal visitors to the Office in Sydney.

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7. TRAINING

During the period the following courses were conducted at the Hydrographic School, H.M.A.S. PENGUIN.

<i>Course</i>	<i>Number of Students</i>	<i>Qualified</i>	<i>Remarks</i>
H4 1/81 - 82	4	4	1 R.M.N.
ADVSR 1/81 - 82	5	5	1 R.N.Z.N.
ABSR 1/81 - 82	8	8	All R.A.N.
ABSR 2/81 - 82	8	8	2 Indonesians
ABSR 3/81 - 82	7	7	3 Fijians
ADVCD	7	7	
Refresher Course	1	—	1 POSR

Surveys for training purposes were conducted as follows:

Jervis Bay	Sir John Young Banks	1:50 000
Neutral Bay	H.M.A.S. PLATYPUS Wharf	1:1 000

Training of students under the Defence Co-operation Programme continues to increase, and to this end the school has had visits from the Surveyors General of the Solomon Islands and Vanuatu.

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8. CHART PRODUCTION

The main chart production effort for the year has been in the revision of existing charts through the preparation of new editions, revised print action and charting blocks for Notices to Mariners. New chart production has been low, reflecting the priority given to the necessary updating of published charts. Manpower productivity levels commensurate with systems-aided production techniques for charting have been achieved; however shortfalls in recruitment to allowable staff ceilings has caused the commitment of available staff to chart revision instead of new chart production. The very large increase in chart products needed for defence purposes during the course of the year was only achieved through the use of the new automative techniques.

The updating of charts for the inclusion of Notices to Mariners information, prior to distribution, continued under the short-run reprint programme and the attachment of post-printing Notices to non-Defence recipients. This is not entirely satisfactory for the mariner, and falls somewhat short of accepted international practices. Charts affected by international charting agreements are amended by hand using on-site contract chart correctors, as well as with in-house screen printing facilities. Both these methods are necessary to ensure timely dissemination of navigational information, but the preference to fully correct all charts issued or sold to the latest Notice to Mariners is at present prohibitively expensive and could only be achieved by higher chart prices.

The Autochart system operation has continued with an up-time in excess of 100 hours per week and a maintenance efficiency above the 99% level for both equipment and software. The policy of whole-unit spare parts coupled with the dedicated on-site contract engineer has proved sound. Software enhancement to the existing facilities and design tasks for Autochart Phase 2 have continued.

The Army Survey corps continued to utilise the system for 40 hours per week during silent hours in emulated Automap 1 mode. This illustrates Autochart's capacity for compatibility with other Defence systems, and ensures maximum useage of this costly capital equipment.

The Office has continued the practice of recent years of arranging for published charts to be folded, prior to distribution, by handicapped persons. The contracts for this essential work are currently with:

The Lorna Hodgkinson Sunshine Home
212 Pacific Highway
Gore Hill.

and Aid Retarded Persons (NSW) Northside Branch
Chatswood Training Industries
O'Brien Street
Chatswood.

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NEW CHARTS PUBLISHED

<i>Number</i>	<i>Title and Limits</i>	<i>Scale</i>
Aus 756*	Australia - South Coast - Western Australia Cape Naturaliste to Cape Leeuwin Limits: Lat. 33°11'39".OS., 34°30'00".OS. Long. 114°21'37".SE., 115°21'00".OE.	1:150 000
1025 PC	Australia - East Coast - New South Wales Kiama to Norah Head Limits: Lat. 33°05'00".OS., 34°41'20".OS. Long. 150°35'00".OE., 153°30'24".OE.	1:600 000

NEW EDITIONS PUBLISHED

Aus 4*	Australia - North Coast - Queensland Approaches to Weipa Limits: Lat. 12°25'00".OS., 12°52'13".OS. Long. 141°27'00".OE., 141°54'09".OE. Plan: Port of Weipa Limits: Lat. 12°39'09".OS., 12°42'01".OS. Long. 141°48'03".OE., 141°53'30".OE.	1:75 000 1:15 000
Aus 58* & L(D8) 58*	Australia - North Coast - Western Australia Port of Dampier and Approaches Plan: Approaches to Dampier Limits: Lat. 20°17'42".OS., 20°43'00".OS. Long. 116°24'00".OE., 116°50'36".OE. Plan: Port of Dampier Limits: Lat. 20°31'29".OS., 20°40'00".OS. Long. 116°38'48".OE., 116°45'46".OE. Plan: Dampier Wharves Limits: Lat. 20°37'53".OS., 20°38'53".OS. Long. 116°42'52".OE., 116°43'46".OE. Plan: Courtenay Channel Limits: Lat. 20°25'30".OS., 20°28'52".OS. Long. 116°41'35".OE., 116°44'00".OE.	1:75 000 1:25 000 1:10 000 1:25 000
Aus 143*	Australia - South Coast - Victoria Port Phillip Limits: Lat. 37°38'30".OS., 38°23'48".OS. Long. 144°21'00".OE., 145°09'00".OE. Plan: The Rip Limits: Lat. 38°15'23".OS., 38°20'37".OS. Long. 144°35'19".OE., 144°43'17".OE.	1:100 000 1:25 000
Aus 155*	Australia - South Coast - Victoria Approaches to Melbourne Limits: Lat. 37°48'30".OS., 38°01'44".OS. Long. 144°40'00".OE., 145°06'27".OE.	1:37 500

* Denotes Metric Chart

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<i>Number</i>	<i>Title and Limits</i>	<i>Scale</i>
Aus 156*	Australia - South Coast - Victoria Western Port	1:37 500
	Limits: Lat. 38°11'20".OS., 38°33'59".OS. Long. 145°01'24".OE., 145°18'24".OE.	
	Plan: Hanns Inlet	1:12 500
	Limits: Lat. 38°21'52".OS., 38°22'29".OS. Long. 145°01'55".OE., 145°14'07".OE.	
	Plan: Crib Point Oil Terminal Jetty	1:12 000
	Plan: Long Island Point Liquids Pier	1:12 000
	Plan: Steel Industry Wharf	1:12 000
Aus 157*	Australia - South Coast - Victoria Geelong Harbour and Approaches	1:37 500
	Limits: Lat. 37°59'06".OS., 38°12'18".OS. Long. 144°20'42".OE., 144°49'18".OE.	
	Plan: Point Henry Pier	1:15 000
	Plan: Corio Quay and Bulk Wheat Pier	1:7 500
	Plan: Geelong Piers	1:6 000
	Plan: Refinery Pier	1:12 500
Aus 158*	Australia - South Coast - Victoria Entrance to Port Phillip	1:37 500
	Limits: Lat. 38°09'48".OS., 38°23'00".OS. Long. 144°35'54".OE., 145°02'24".OE.	
Aus 245*	Australia - East Coast - Queensland Port Curtis	1:37 500
	Limits: Lat. 23°48'00".OS., 24°01'07".OS. Long. 151°11'31".OE., 151°33'03".OE.	
	Plan: South Trees Point	1:7 500
	Limits: Lat. 23°50'46".OS., 23°51'35".OS. Long. 151°18'08".OE., 151°19'33".OE.	
	Plan: Auckland Point to Barney Point	1:7 500
	Limits: Lat. 23°49'42".OS., 23°50'29".OS. Long. 151°14'27".OE., 151°16'43".OE.	
Aus 4601* (INT 601)	South Pacific Ocean - Tasman Sea New Zealand to S.E. Australia	1:3 500 000
	Limits: Lat. 33°30'00".OS., 49°28'41".OS. Long. 142°30'00".OE., 175°50'09".OE.	
Aus 4602* (INT 602)	South Pacific Ocean - Tasman and Coral Seas Australia to Northern New Zealand and Fiji	1:3 500 000
	Limits: Lat. 16°00'00".OS., 35°17'24".OS. Long. 146°40'00".OE., 180°00'00".OE.	
Aus 4603* (INT 603)	Indian Ocean, Australia, North Coast and Adjacent Waters	1:3 500 000
	Limits: Lat. 01°00'00".OS., 22°00'25".OS. Long. 115°10'00".OE., 148°30'00".OE.	

* Denotes Metric Chart

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<i>Number</i>	<i>Title & Limits</i>	<i>Scale</i>
Aus 4604* (INT 604)	South Pacific Ocean Coral and Solomon Seas and Adjacent Waters Limits: Lat. 0°06'00".0N., 20°59'03".6S. Long. 146°40'00".0E., 180°00'00".E.	1:3 500 000
Aus 4708* (INT 708)	Indian Ocean, Australia, West Coast Limits: Lat. 05°30'00".0S., 36°20'00".0S. Long. 96°05'00".0E., 117°30'00".0E.	1:3 500 000
Aus 4709* (INT 709)	Southern Ocean Australia, South Coast Limits: Lat. 31°00'00".0S., 47°31'00".0S. Long. 111°54'00".0E., 145°14'00".0E.	1:3 500 000
Aus 5020A	Index of Australian Charts Northern Portion	
Aus 5020B	Index of Australian Charts Southern Portion	

* Denotes Metric Chart

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CHARTS IN PRODUCTION (30th June, 1982)

NC - New Chart

NE - New Edition

<i>No</i>	<i>Category</i>	<i>Title</i>	<i>Scale</i>	<i>State</i>
Aus 113	NE	Port of Fremantle	1:7,500	WA
Aus 112	NE	Approaches to Fremantle	1:37,500	WA
Aus 112Y	NE	Approaches to Fremantle (Yachting Edit).	1:37,500	WA
Aus 109	NC	Princess Royal Harbour	1:12,500	WA
Aus 198	NE	Approaches to Botany Bay & Port Hacking	1:25,000	NSW
Aus 777	NE	Winceby Island to Point Riley	1:150,000	SA
Aus 111	NC	Careening Bay & Approaches	1:7,500	WA
Aus 837	NC	Olinda Entrance to Maer Island	1:150,000	Q
Aus 836	NC	Cape Weymouth to Olinda Entrance	1:150,000	Q
Aus 376	NC	Torres Strait	1:300,000	Q
Aus 110	NC	King George Sound	1:25,000	WA
Aus 118	NC	Approaches to Albany	1:75,000	WA
Aus 759	NC	Point Hillier to Bald Island	1:150,000	WA
Aus 336	NC	Cape Leeuwin to King George Sound	1:300,000	WA
Aus 4	NE	Approaches to Weipa	1:75,000	Q
Aus 182	NC	Plans on the South East Coast of Victoria	Various	Vic
Aus 181	NC	Corner Inlet	1:50,000	Vic
Aus 244	NC	Plans in Port Curtis	Various	Q
Aus 245	NC	Port Curtis	1:25,000	Q
Aus 246	NC	Approaches to Port Curtis	1:37,500	Q

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CHARTS ON PROGRAMME (30th June, 1982)

(Revised Quarterly)

NC - New Chart		NE - New Edition		
No	Category	Title	Scale	State
Aus 81	NE	Approaches to Geraldton	1:25,000	WA
Aus 292	NE	Adolphus Channel to Harvey Rocks	1:75,000	Q
Aus 835	NE	Cape Weymouth to Cairncross Islets	1:150,000	Q
Aus 839	NE	Cairncross Islets to Arden Island	1:150,000	Q
Aus 840	NE	Arden Island to Bramble Cay	1:150,000	Q
Aus 832	NE	Cape Flattery to Barrow Point	1:150,000	Q
Aus 54	NE	Port Hedland	1:7,500	WA
Aus 59	NC	Plans in Port of Dampier	Various	WA
Aus 58	NC	Approaches to Port of Dampier	1:37,500	WA
Aus 116	NC	Plans in Western Australia - West & South coasts	Various	WA
Aus 137	NE	Port Adelaide	1:12,500	SA
Aus 607	NC	Macquarie Island	1:100,000	Southern Ocean
Aus 262	NE	Port of Cairns	1:20,000	Q

NOTE: Immediate requirements outside this programme are met by Chart Maintenance and Revision procedures. See revised charts under Chart Printing below.

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MISCELLANEOUS PRODUCTS

Australian facsimile reproduction of British Admiralty Charts. (0)

Australian modified reproduction of British Admiralty Charts (0)

Publications - (2)

Australian National Tide Tables 1982 (AHP 11)

Annual Summary of Australian Notices to Mariners - Jan. 1982

Fleet charting (161)

Departmental cartographic reproduction (166)

CHART PRINTING

New Charts - 2

New Editions - 17

Revised Charts - 166

Reprinted Charts - 318

Facsimile Reproductions - 0

Modified Reproductions - 0

Charts for Fleet purposes - 8

Miscellaneous charts - 6

Chart printing by Survey Regiment Bendigo, Victoria - 517 charts; 136 850 copies

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9. TIDES

Australian National Tide Tables.

3000 copies were printed of the 1982 edition. There was no substantial change in content or format from the previous edition.

There were several changes in the input for the 1983 edition. The United Kingdom Hydrographic Department (U.K. H.D.) advised that Papua New Guinea was no longer commissioning predictions for Dreger Harbour, Seadler Harbour, and Port Moresby from the Institute of Oceanographic Sciences, Bidston, U.K., (I.O.S.), and that the predictions for these ports would henceforth be available directly from U.K. H.D. The Maritime Services Board of New South Wales advised that predictions for Sydney and Newcastle would be produced by the Flinders Institute for Atmospheric and Marine Sciences rather than by the I.O.S. As a consequence, it became the responsibility of this Office to provide the predictions for these two ports to U.K. H.D., and the predictions for Sydney to the Deutsches Hydrographisches Institut, the Maritime Safety Agency of Japan, and the National Ocean Survey of the United States of America. These predictions were provided in magnetic tape form. The Public Works Department of Western Australia advised that they wished to substitute Cape Lambert for Port Samson, and provided the predictions for this port.

With the above changes, the input for the 1983 edition of the Australian National Tide Tables comprised printed copies of the predictions for the three Papua New Guinea ports mentioned and predictions on magnetic tape for 64 tidal stations and one tidal stream station. The magnetic tapes were edited using computer bureau service facilities to provide input to a computer-assisted typesetting process. 2500 copies of the 1983 edition have been ordered.

Hydrographic Surveys.

Tidal data for proposed surveys was provided as required. Bench mark reports, records of tidal observations, and records of tidal stream observations were received from completed surveys.

In addition to the data for surveys in the area of Australian charting responsibility, a requirement arose for tidal data in the Solomon Islands area. The relevant data were obtained from U.K. H.D. and tidal predictions were produced for two stations in the proposed survey area.

Chart production.

Lowest Astronomical Tide was computed for a number of stations required for new or revised charts. Information on bench marks, tidal levels and datums, and tidal streams was provided as required for new charts or new editions of charts.

National Mapping Council Permanent Committee on Tides and Mean Sea Level.

The Tides Officer attended the third meeting of the Permanent Committee in August 1981 as the Hydrographer's nominee, and continued as Convenor of the Working Group appointed by the Committee. The Working Group held three meetings, in October 1981, and in February and April 1982. The Permanent Committee is working towards the establishment, maintenance and supervision of a monitoring network of sea-level recorders, regular level connections with the national levelling network, professional treatment of the data, and regular processing, in order to determine mean sea level, harmonic tidal constants and non-tidal residuals, and the provision of a responsible archive of these data sets. Through the Working Group, the drafting of a booklet "Operating Procedures for Tide Gauges on the National Network" is nearing completion. Information on the details of the permanent tide gauges operating around the coastline is being updated. A national tidal data base is being established and has reached the stage that an indexing system is operational for observations, constants and residual time series, and entry of some observations and residuals has taken place.

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10. NOTICES TO MARINERS

The ready availability of Forms AH 102 and 102A (Hydrographic Notes), attached to the weekly editions of Notices to Mariners, has continued the increase in the number of reports received from a wide variety of authorities and other mariners.

Details of shoal depths and dangers in the Australian area of charting responsibility, promulgated by other charting authorities, are investigated and compared with data held in this Office, before publication in Australian Notices to Mariners.

Statistics for period ended 30th June 1982 are as follows:

H/Notes from H.M.A. Ships	98
H/Notes from other sources	96
Notices to Mariners (WE 27/82)	684
Blocks for Charts	28
Blocks for Cautions etc.	62

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11. CHART ISSUES AND SALES

During the year a total of 189,761 charts and publications were issued through the Issues Branch and sold through the Chart Agency; this represents a reduction in volume of 1.7% over 1980/81. However, revenue earned through the sale of charts and associated publications for 1981/82 increased to a new record level of \$694,747, an increase of 22.6% over the previous financial year.

This has been achieved during a period of acute staff shortages over many months. Despite these problems, the standard of service to both official and private customers has continued at its traditionally high level.

The details are shown in Appendix 3, together with those for the previous four years. For the first time, the income from sales has been included for the last two years.

During the course of the year, one Class B agency resigned and four new Class B agencies were appointed. There are now 16 Class A and 63 Class B agencies authorised.

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12. EQUIPMENT

Laser Airborne Depth Sounder

During the period of this report, Thorn Electronics Australia Pty. Ltd. was awarded the development contract for the Laser Airborne Depth Sounder (LADS), the production model of WRELADS II. Hydrographic Office staff are closely involved in this project especially in connection with the methods to be used in processing the data to a form acceptable for charting and for acceptance by the Hydrographic Data Base.

It is expected that this stage of the project will be completed in early 1983, and it is hoped that the LADS unit will become operational in early 1985.

Survey Motor Boats

The new pattern of survey motor boats are now embarked in MORESBY and FLINDERS. They are 34ft long and are powered by twin water jets. Some shortcomings in their design have become apparent and rectification of these is being examined.

Electronic Nav aids

During the year, the full outfits of Miniranger (MRS III) have been issued to field units. This equipment has allowed Officers-in-Charge of Surveys to have an alternative fixing system and consequently more flexibility in carrying out their hydrographic instructions.

A contract with an Australian company has been let for the maintenance of Argo DM 54, the primary fixing system of R.A.N. surveying ships, and H.M.A.S. MORESBY's Argo chain was refitted during the period. An operators' and maintainers' course was conducted in-country by a representative of the manufacturers, Cubic Western Data.

Autochart

Autochart has entered into Phase II of the acquisition plan. Tenders have been accepted for a system equipment expansion, and modification of the 4th floor of the Hydrographic Office is progressing to accommodate the high precision plotter.

Future Projects

Plans are proceeding in several new fields to develop equipment and facilities for surveying and for data management in the Office. Design studies are being made into a new class of Surveying Motor Launch which it is hoped will enter service in the mid-to-late 1980s both to support the LADS operation and to carry out surveys in inshore and reef areas where the larger ships cannot operate.

In the Office, the HYDROCOMP project is gathering momentum to provide a storage and processing facility for oceanographic and tidal data. Also in the Office it is hoped to install during the next few months the HYDROSTOK facility to modernise stock records and accounting procedures in the Chart Depot and Agency.

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13. LIBRARY

In 1981/82 closer links were developed between the Hydrographic Office Library and the wider network of Defence Information Service (DIS) libraries. During the year publications valued at \$1797 were provided by Defence Information Services Branch in recognition of the Office's role as a library specializing in the areas of hydrography, oceanography, cartography and related disciplines. In addition, DISTIS (Defence Information Services Technical System) provided the library with DUCOR (Defence Union Catalogue of Reports), a computer-based micro-fiche catalogue, which gives access to 110,000 documents held by DIS libraries and Defence centres.

In 1981/82, a large amount of surveying data, reports and other publications were received from international, federal and state authorities, ports and marine departments, and other organizations concerned with hydrography, oceanography, marine sciences and mapping.

An important task for 1982/83 will be to establish closer ties with such authorities, particularly on the international level, in order to co-operate in, and gain benefit from, document exchange arrangements. This is especially important in the oceanographic area, in view of the planned expansion of the Hydrographer's oceanographic activities. The period will also see progress towards development of a computerised storage and retrieval system in the library.

Appendix II lists hydrographic information received during the year from non-service sources in Australia and Papua New Guinea.

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APPENDIX I

CHART AND DRAWING OFFICE PRODUCTION

	1977/78	1978/79	1979/80	1980/81	1981/82
New charts published for general use	8	9	7	7	2
New Charts/Diagrams for Naval use	8	1	1	38	52
New Editions for general use	4	9	14	6	17
New Editions for special purposes	—	—	2	—	—
Stock replenishment (Reprints & Revision)	208	345	360	295	484
Block Corrections for Aus. Notice to Mariners	2	5	15	14	20
Aus. Notice to Mariners issued	630	567	731	715	684
Aus. charts printed in U.K. (Facsimile Reproduction)	8	7	12	6	10
B.A. Charts printed in Australia (Facsimile Reproduction)	1	3	3	2	0
Hydrographic Notes from H.M.A. Ships	28	36	77	70	98
Hydrographic Notes from other sources	65	43	54	92	96
Modified facsimile of B.A. chart	14	—	—	1	0
*Fleet charting					161
*Departmental					166

**Not reported previously*

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APPENDIX II

HYDROGRAPHIC INFORMATION FROM NON-SERVICE SOURCES

<i>General Locality</i>	<i>Title or Location of Survey</i>	<i>Source</i>
QUEENSLAND		
Gladstone	Abbot Point Harbour Entrance/ Dredged Limits	Gladstone Harbour Board Department of Harbours and Marine
Cairns	Smiths Creek Cairns Harbour	Cairns Harbour Board
Weipa	South Channel Cora Bank Coburg Shoal	Department of Harbours and Marine
Moreton Bay	Rous Channel (Report of Survey)	Department of Harbours and Marine
Brisbane	Cairncross Dock Brisbane River, Wharves	Department of Harbours and Marine Port of Brisbane Authority
Capricorn Coast	Stockyard Point Cape Capricorn (Investigation)	Department of Harbours and Marine Department of Harbours and Marine
Shoalwater Bay	Stanage Point to Broome Head	Department of Harbours and Marine
Lucinda	Leads/Swing Basin	Department of Harbours and Marine
Barrier Reef	Satellite Imagery	Australian Landsat
Torres Strait	Satellite Imagery	Eros
NEW SOUTH WALES		
Botany Bay	Navigation Marks	Maritime Services Board
Georges River	Navigation Marks	Maritime Services Board
Bermagui	Fishermans Jetty (Soundings)	Public Works Department
Tweed River	Entrance	Public Works Department
Georges River	Oyster Bay Kogarah Bay	Public Works Department
SOUTH AUSTRALIA		
Adelaide	Port Adelaide River	Department of Marine and Harbors
Yorke Peninsula	Port Victoria	Department of Harbours and Marine
VICTORIA		
Port Phillip	Pilot Pier Approach West Channel	Public Works Department
Barry Beach	Terminal	ESSO
Port Albert	Wharf Plans	Public Works Department
Corner Inlet	Welsh Pool Jetty Channel WFO	Public Works Department
Crib Point	Jetty	Public Works Department
Geelong	Corio Bay	Port of Geelong Authority

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<i>General Locality</i>	<i>Title or Location of Survey</i>	<i>Source</i>
WESTERN AUSTRALIA		
Mermaid Sound	Anchorage	Woodside
Africa Reef	Port Site	Clough
Robe River		Clough
Port Denison	Fishing Boat Harbour	Public Works Department
Mandurah	Boating Chart	Public Works Department
Warnbro	Boating Chart	Public Works Department
Shark Bay	Investigation	Public Works Department
Geraldton	Port Approach	Public Works Department
	Post Dredge Soundings	Public Works Department
	Lights/Nav aids	Public Works Department
Albany	Jetty	Public Works Department
	Navigation Aids	Public Works Department
	Harbour Works	Public Works Department
Parker Point	Navigation Aids	Woodside
Dampier	Port Approaches	Hammersley Iron
Phillip Point	Navigation Aids, Planned	Woodside
	Port Works	

Indexes of surveys along the coast were also received from the Public Works Department.

PAPUA NEW GUINEA

Lae	Harbour	Department of Transport of Papua New Guinea
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Additional bathymetric and marine survey data was received from a variety of other sources throughout the year.

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APPENDIX III

SALES AND ISSUES 1977-1982

R.A.N. CHART AGENCY AND CHART DEPOT

	1977/78	1978/79	1979/80	1980/81 (\$)	1981/82 (\$)
Aus. Charts sold by Agency	103,475	112,571	140,981	124,799 (448 801)	121,862 (557 676)
Aus. Charts issued by Depot	21,065	24,312	24,735	24,024	27,710
B.A. Charts sold by Agency	16,134	11,343	9,017	7,854 (53,231)	7,752 (57,537)
B.A. Charts issued by Depot	14,073	12,067	14,986	16,454	11,273
N.Z. Charts sold by Agency	517	330	303	223 (768)	477 (2,800)
N.Z. Charts issued by Depot	1,018	1,268	933	1,023	1,236
Misc. Charts issued by Depot	3,091	18,288	11,328	4,708	4,605
Canadian Charts sold by Agency †				8 (40)	18 (90)
Total Charts Sold	120,126	124,244	150,301	132,876 (502,840)	130,091 (618,103)
Total Charts Issued	39,247	55,935	51,982	46,209	44,824
Aus. Publications Sold	2,475	2,113	1,970	1,739 (13,664)	1,861 (18,434)
Aus. Publications Issued	528	1,023	494	967	593
B.A. Publications Sold	8,208	7,022	5,544	4,401 (50,133)	4,633 (58,209)
B.A. Publications Issued	3,076	4,841	4,221	5,351	6,011
Misc. Publications Sold	533	1,343	1,281	1,168 (*)	1,287 (*)
Misc. Publications Issued	595	449	543	400	461
N.Z. Publications Sold	3	—	4	—	—
Total Publications Sold	11,219	10,478	8,799	7,308 (63,797)	7,781 (76,643)
Total Publications Issued	4,199	6,313	5,258	6,718	7,065
Total Sales	131,345	134,722	159,100	140,184 (566,637)	137,872 (694,746)
Total Issued	43,446	62,248	57,240	52,927	51,889
TOTALS	174,791	196,970	216,340	193,111	189,761

† Not reported previously

(*) Value of Misc. Publications Sold is included
in figures for Aus. Publications Sold

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APPENDIX IV

MANPOWER

Numbers of naval surveying and civilian staffs employed in the Hydrographic Service on 30th June 1982 were as follows:-

Naval

Captain	1	(RN Loan)
Commander	3	(1 RN Loan)
Lieutenant Commander	7	(1 serving as Acting Commander)
Lieutenant	15	
CPO SR	4	
POSR	8	
LSSR	18	
ABSR	48	

Total:	Officers	26 (2 on loan)
	Sailors	78

(Meteorological specialists have not been included)

Civilian

Public Service Act Positions

	Establishment	Ceiling	Manning	Shortfall
Executive	1	1	1	0
Cartographic	53	44	34	10
Systems Development	4	4	3	1
Administration	6	6	6	0
Library/Records	2	2	2	0
Distribution	12	12	8	4
Science Branch	3	2	1	1
Survey Branch	4	4	3	1
Totals	85	75	58	19

Naval Defence Act Positions

Trainees and Cadets	2	2	2	0
			10	

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APPENDIX V

SENIOR PERSONNEL IN THE HYDROGRAPHIC OFFICE - JUNE 1982

Hydrographer, R.A.N.

Captain J.A.L. MYRES, FRICS, R.N.

CANBERRA OFFICE

Staff Officer (H)
Director of Naval Oceanography
and Meteorology

Lieutenant Commander J.W. LEECH, R.A.N.

Commander J.H. MATHEWS, M.Sc, R.A.N.

SYDNEY OFFICE

Senior Administrative Staff

Deputy Hydrographer
Deputy Director Cartography
Administrative Officer

Commander J.J. DOYLE, R.A.N.
Mr. K.G. BURROWS, B.Bus (Pub Admin)
Mr. H. SWEET

Survey Branch

Assistant Hydrographer - Hydrography
Assistant Hydrographer - Operations
Notice to Mariners
Tides

Commander R.E. HEARSEY, R.N.
Lieutenant Commander G.J. BOND, R.A.N.
Commander, R.J. HARDSTAFF, A.I.S., R.A.N. (Rtd.)
Mr. P. KELLY, B.Sc., A.S.T.C., M.INST.P.

Cartographic Branch

Chief Systems Analyst
Chief Cartographer, Automation
Chief Cartographer, Charting
Superintendent Chart Depot
Library and Records Officer

Mr. J.L. DEAN, Dip. E.C., M.A.C.S.
Mr. R.A. FURNESS, B.Bus., M.A.I.C.
Mr. B.C. LEONARD
Miss J.M. HIPPISEY
Mr. P. WRIGHT

Science Branch

Staff Officer Oceanography
Officer-in-Charge, A.O.D.C.

Lieutenant Commander G.W.G. SIMM, M.A., R.N.
Mr. B.J. SEARLE, B.Sc.

H.M.A.S. Penquin

Officer-in-Charge, Hydrographic School

Lieutenant Commander P. JONES, R.N.

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APPENDIX VI

MEETINGS, INSPECTIONS AND VISITS

Hydrographer R.A.N.

15 - 17 September 1981	Hobart - National Mapping Council Meeting
28 October - 1 November 1981	Mackay - Annual Inspection H.M.A.S. FLINDERS
18 - 30 April 1982	Monaco - International Hydrographic Conference
3 June 1982	Melbourne - Maritime Advisory Committee
4 June 1982	Adelaide - LADS Briefing

Deputy Hydrographer

12 November 1981	Canberra - Meeting Attorney General's Department
21 December 1981	Canberra - Meeting Dept. National Mapping
3 June 1982	Melbourne - Maritime Advisory Committee
4 June 1982	Adelaide - LADS Briefing
10 June 1982	Canberra - LADS Programme

Assistant Hydrographer (Hydrography) R.A.N.

29 June - 3 July 1981 & 6 - 9 July 1981	Canberra - National Mapping and Survey Interdepartmental Group
28 - 30 July 1981	Canberra - Interdepartmental Meeting of Mapping Groups
24 - 27 August 1981	Adelaide - AAPMA Technical Sub-Committee Conference
9 - 21 November 1981	Honiara - DCP Visit (Solomon Islands)
31 May - 4 June 1982	Brisbane - Technical Sub-Committee National Mapping
21 - 22 June 1982	Adelaide - LADS project Study

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Visitors

1 September 1981	Captain C.R. Pascual Bureau of Coast and Geodetic Survey, Manila
7 September 1981	Mr. Deuitt Systemhouse Ltd., Ottawa, Canada
21 September 1981	Mr. P.L. Barton The Alexander Turnbull Library, New Zealand
16 December 1981	Dr. D. Shoji Ret. Chief Hydrographer, Japan Mr. K. Tani Consul - General, Japan
22 February 1982	Mr. H. Krietsch Overseas Marketing Manager, Honeywell-Elac (U.S.A.)
4 March 1982	Vice Admiral Sir James Willis, K.B.E., A.O. Chief of Naval Staff
9 March 1982	Rear Admiral A.J. Robertson, A.O., D.S.C. Flag Officer Naval Support Command
30 March 1982	Rear Admiral D.W. Haslam, C.B., O.B.E., F.R.I.C.S. Hydrographer of The Navy, Taunton, U.K.
16 April 1982	Lieutenant Commander P.D. Barton, R.N. O.I.C. Hydrographic Unit, Royal Fiji Military Forces
26 May 1982	Mr. G.R. Jeune Chief Cartographer. Department of Lands and Survey, New Zealand
26 June 1982	Rear Admiral K. Vonthethoff Flag Officer Naval Support Command

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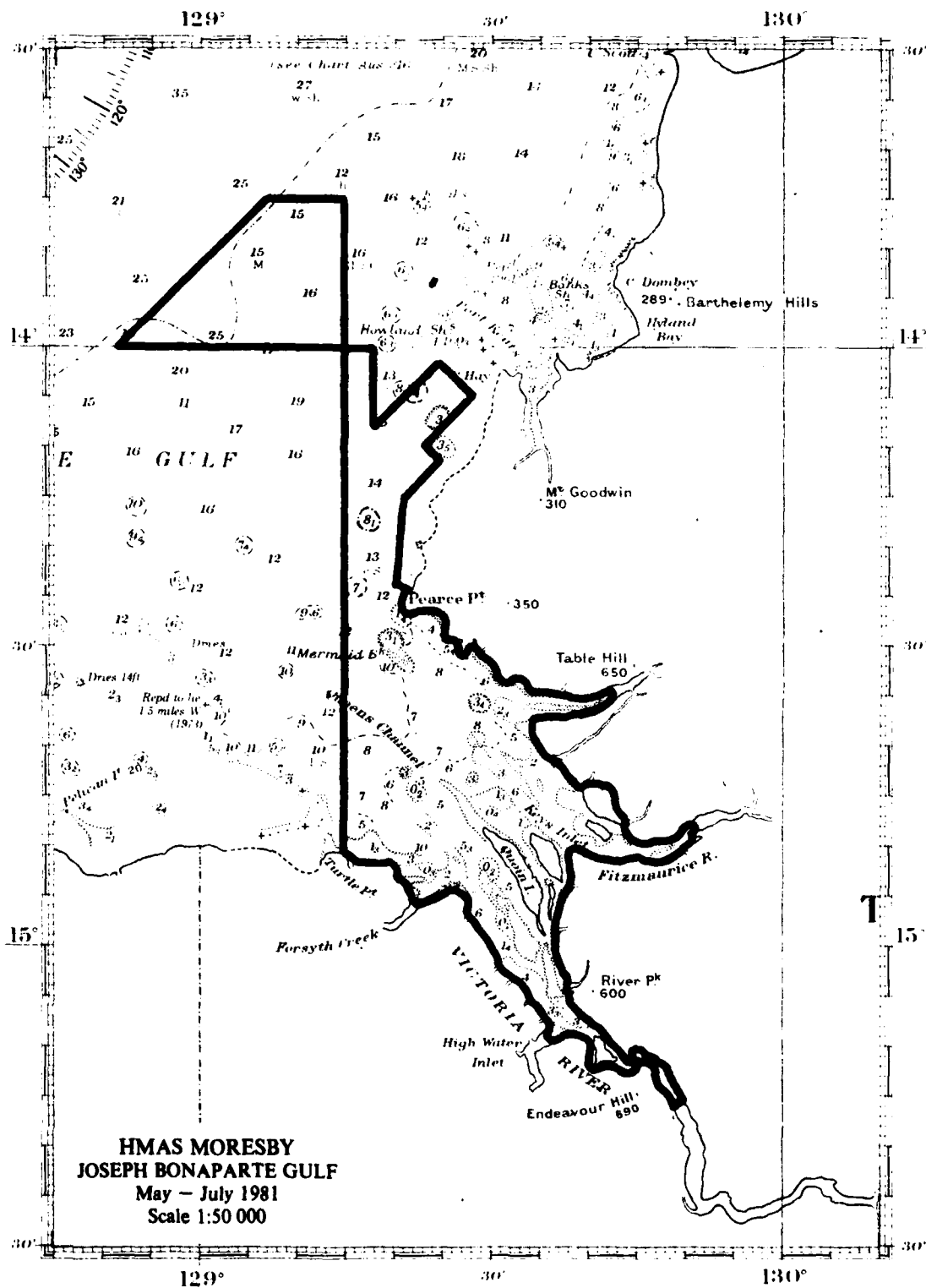
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APPENDIX VII

EXPENDABLE BATHYTHERMOGRAPH OBSERVATIONS

The AODC received 3249 original XBT traces from R.A.N. ships and various Australian marine science organisations. After checking, 2264 traces were retained for addition to the data bank.

<i>Ship or Organisation</i>	<i>No. of XBTs retained</i>
H.M.A.S. ADELAIDE	84
H.M.A.S. CANBERRA	145
H.M.A.S. HOBART	296
H.M.A.S. PERTH	487
H.M.A.S. BRISBANE	216
H.M.A.S. YARRA	114
H.M.A.S. PARRAMATTA	86
H.M.A.S. SWAN	427
H.M.A.S. TORRENS	51
H.M.A.S. VAMPIRE	119
H.M.A.S. MORESBY	48
H.M.A.S. COOK	28
ANTARCTIC DIVISION	140
C.S.I.R.O.	23
Total	2264

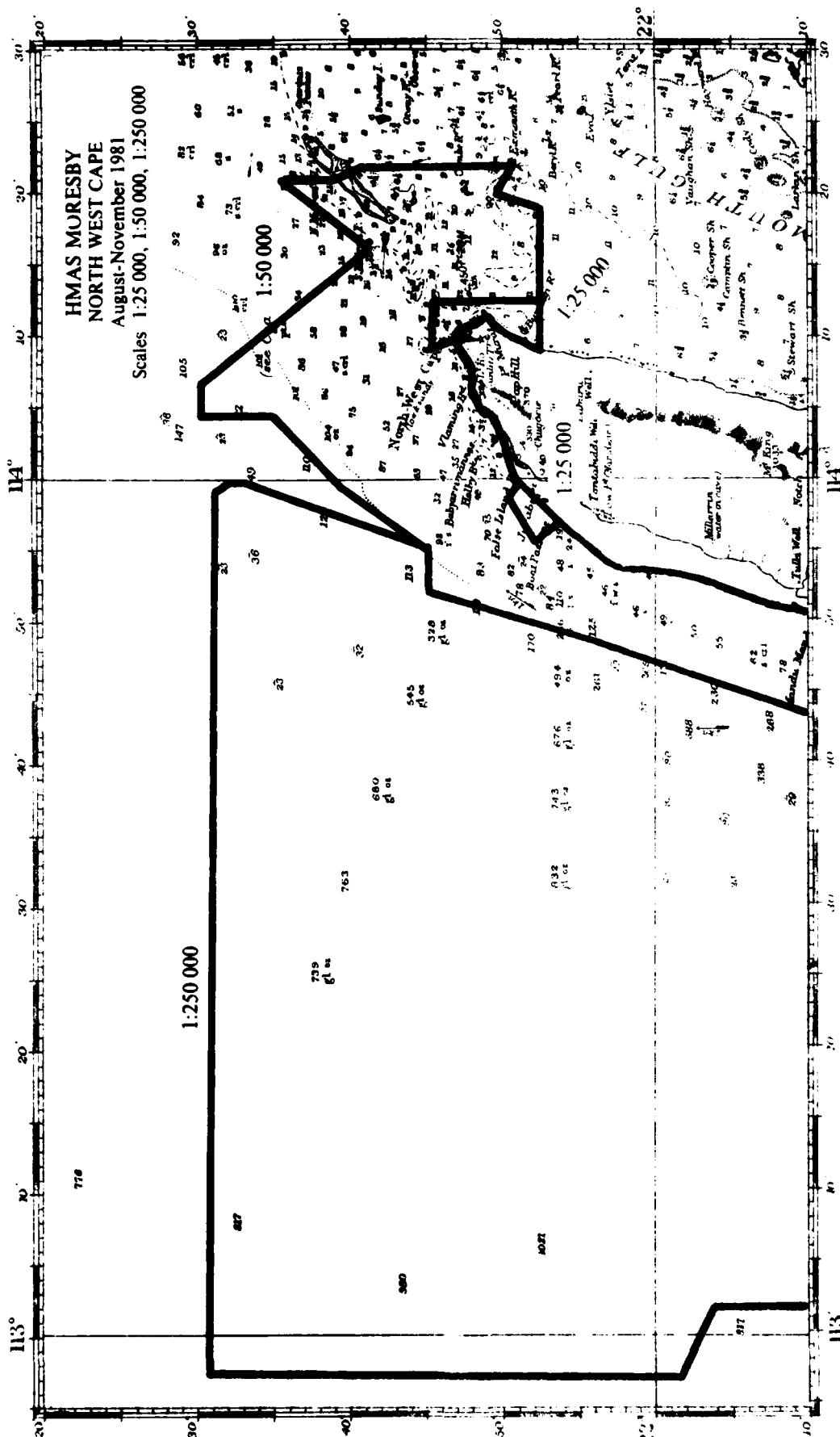


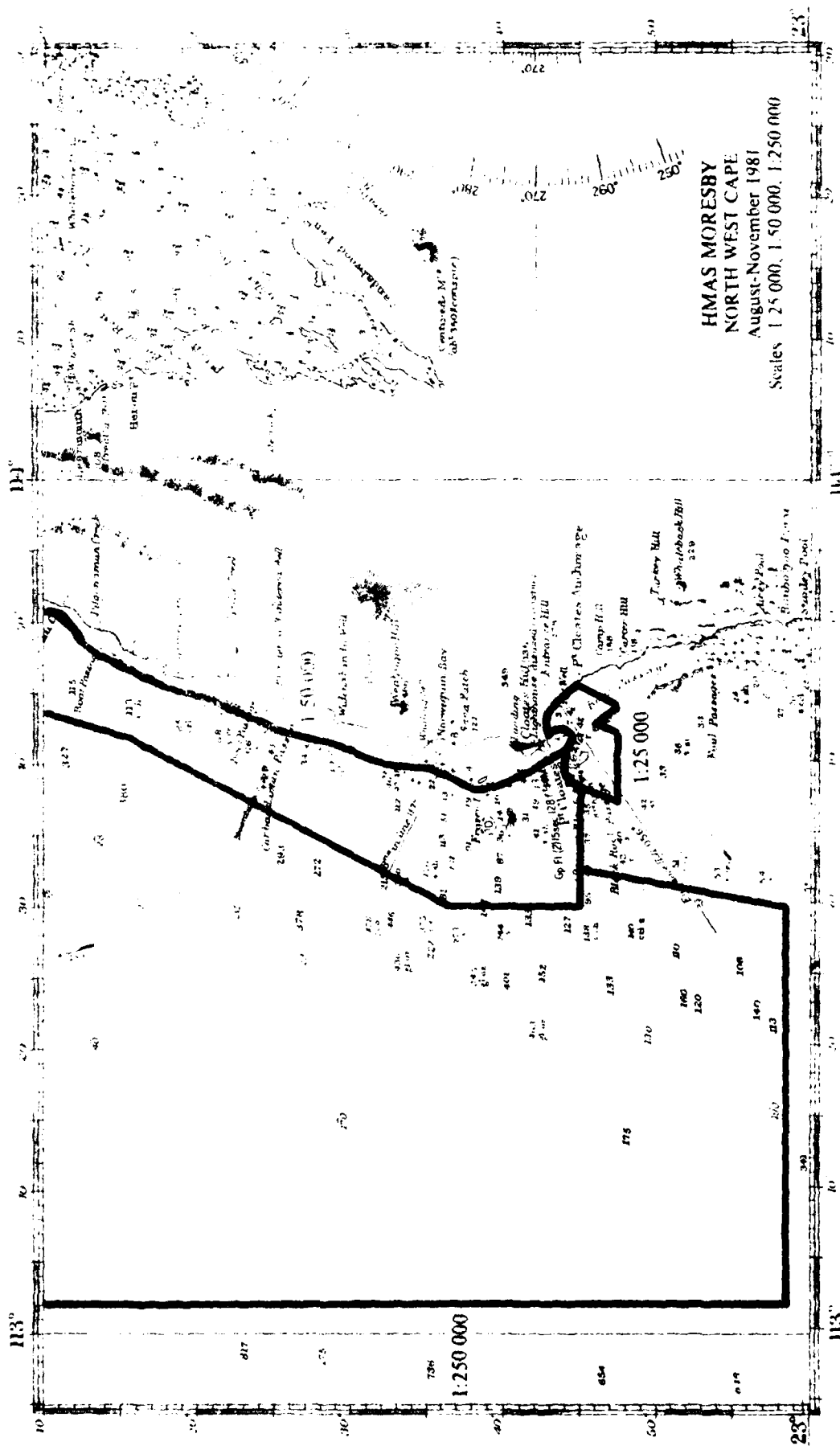
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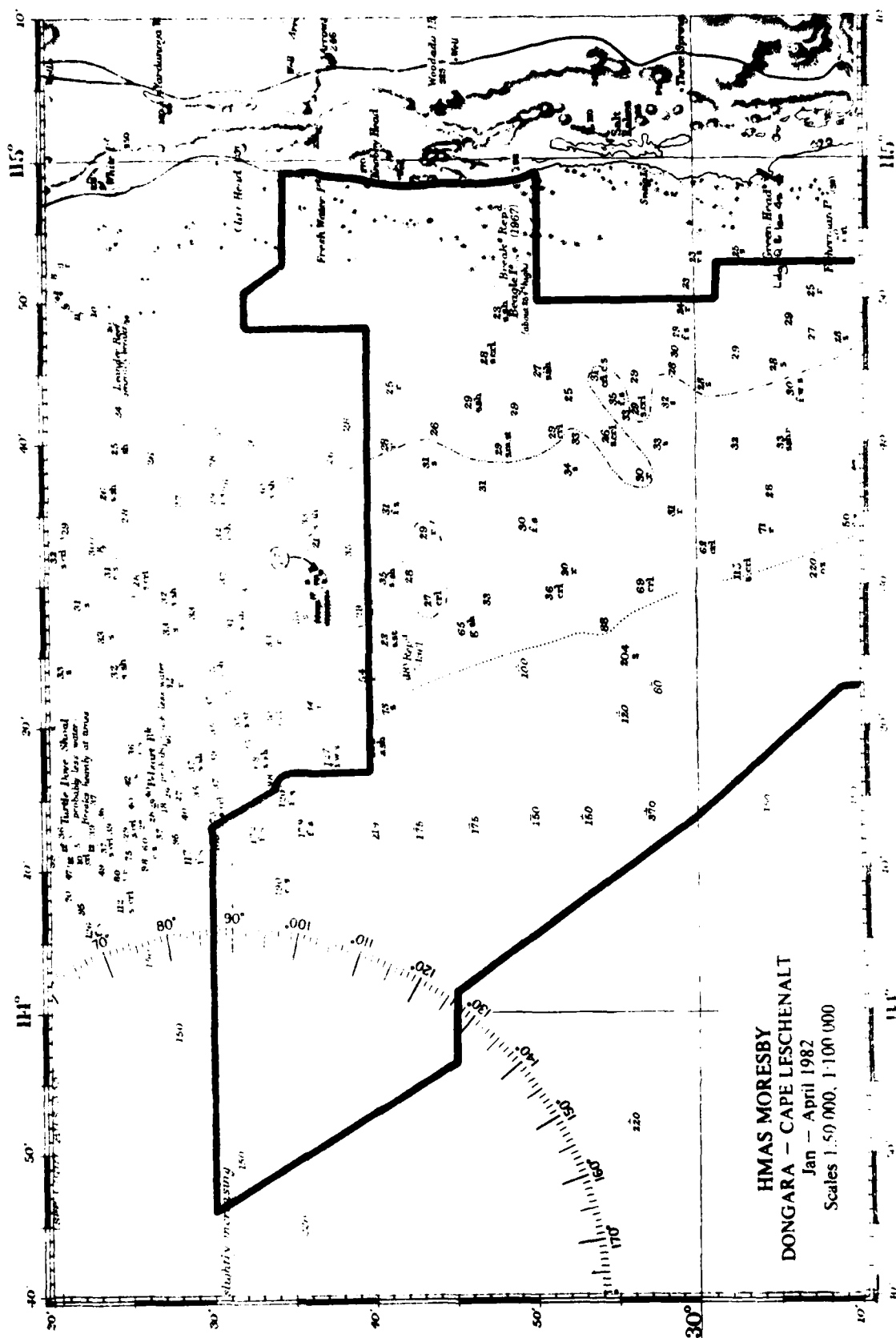
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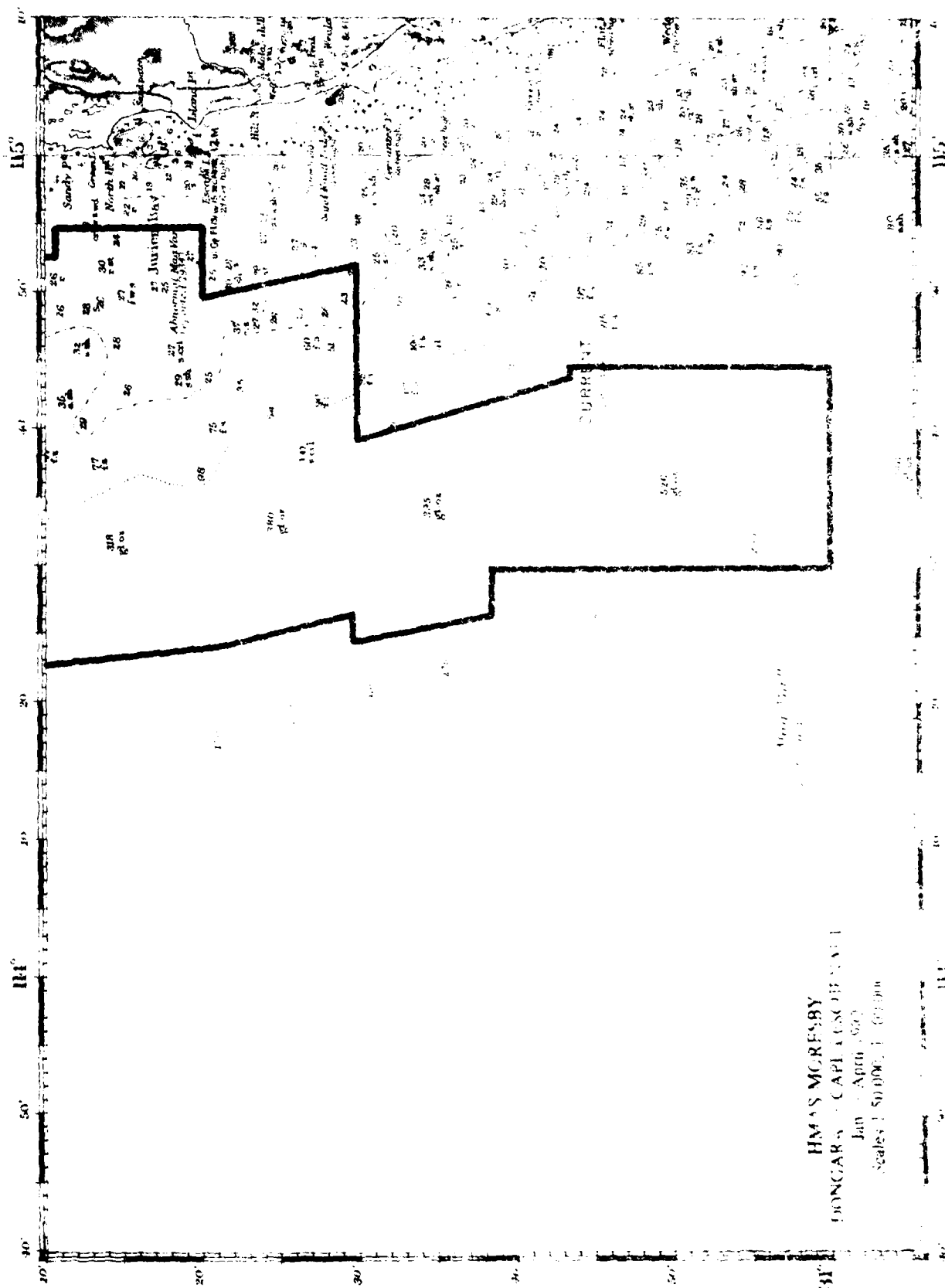
11



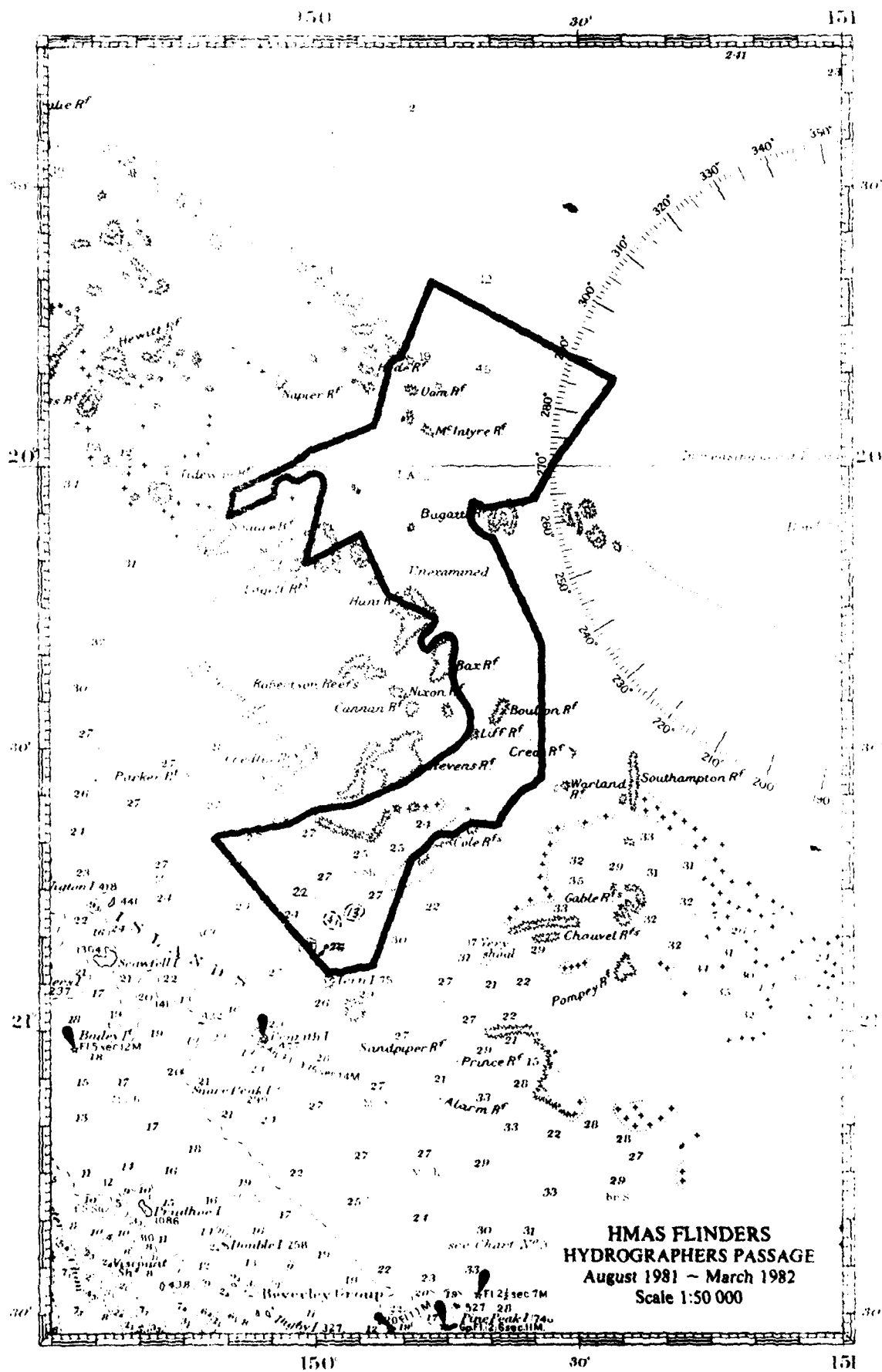


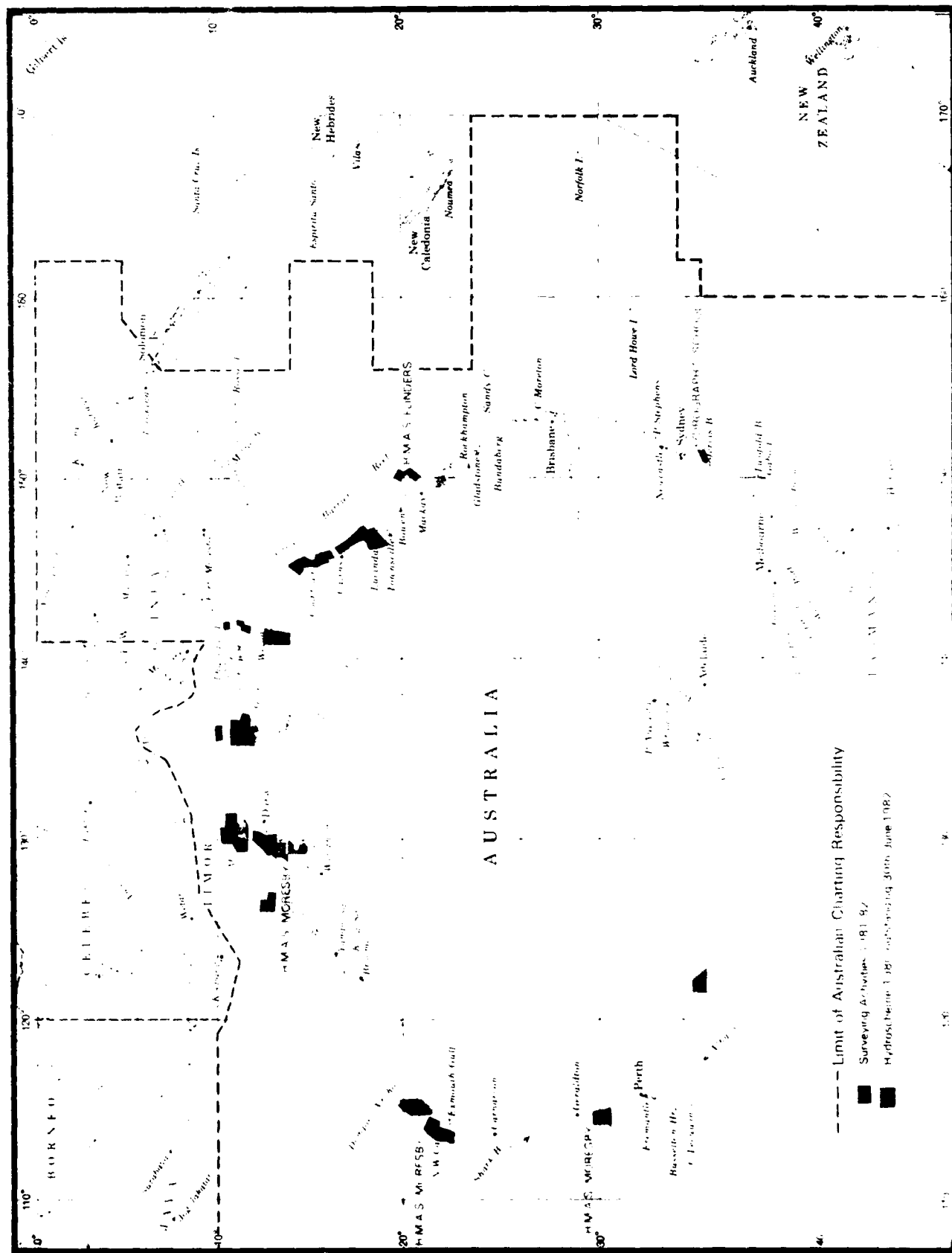
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